WHITE PAPER

CREATING CONNECTED COMMUNITIES IN U.S. STATE AND LOCAL GOVERNMENT

State and local governments share common challenges—to maintain a safe environment for their citizens, increase service effectiveness, improve educational excellence, and drive economic development. Despite reduced budgets, governments across the United States are achieving these goals today—without increasing operational costs. Governments are improving their services through process change, enabled by advanced network technologies.

EXECUTIVE SUMMARY

By adopting new business processes and the network technologies that make them possible, state and local governments are improving citizen safety, increasing the effectiveness of their services, fostering educational excellence, and boosting economic development. For example, the City of Everett, Washington enhances public safety by providing its police officers with in-vehicle access to network-based law enforcement tools. The Bernalillo County Metro Court in Albuquerque, New Mexico improved the effectiveness of its justice process by conducting video interviews and arraignments with inmates in another facility, which saves time and avoids the costs of transport vehicles and extra security. The Charles County Public School system in Maryland saves teachers time by using IP phones to report attendance. And the city of Greensboro, North Carolina encourages residential and commercial construction with faster building approvals, a result of allowing inspectors to wirelessly submit inspection reports and retrieve needed information from multiple convenient locations throughout the city. The common thread in all of these successes? Process change, enabled by network solutions such as wireless connectivity and IP telephony.

This white paper explains the main challenges for U.S. state and local governments, and describes how different governments across the country are meeting them today. For a technical description of the business solutions mentioned in this white paper, see the technical white paper, *Connecting Communities in State and Local Government*, available at www.cisco/go/localgov.

IMPROVING PUBLIC SAFETY

Elements of a Safe Environment

A safe environment has two components: data and network security, and the awareness and responsiveness of public safety agencies.

Data and Network Security

State governments have a responsibility to safeguard private citizen and government information. Recent regulations and activities include the Gramm-Leach-Bliley Financial Modernization Act, which addresses the privacy of personal information exchanged among financial institutions; the Government Information Security Reform Act (GISRA), which requires government agencies to assess the security of their IT infrastructures; the Health Insurance Portability and Accountability Act (HIPAA), which establishes national security and privacy standards for electronic transactions of healthcare data; and California Senate Bill 1386, which requires organizations that maintain personal data of California residents to publicly disclose breaches to network security. Governments are using technology to protect private information. For example, the state of Alabama complies with privacy regulations by using an integrated security solution from Cisco Systems®. "The citizens of Alabama can feel confident that they won't see their private records displayed on some Website," says Andy Cannon, manager of network operations for the state of Alabama.

Governments must not only protect private information on their networks, but they must also protect the network itself from viruses, worms, and hacker attacks that might otherwise threaten continuity of government services. In fact, as governments rely increasingly on their networks to deliver services such as emergency communications during a disaster or power outage, the importance of network availability for safety has skyrocketed.

PUBLIC SAFETY

Elements of public safety include:

- Increasing situational awareness throughout the community. First responders can be more effective if they can receive floor plans, real-time video footage, and other facility information before they arrive at a site. The city of Everett, Washington is adding wireless capabilities so that it can reach public safety officers in any location, including in moving vehicles.
- Improving responsiveness. The faster that officials and safety workers are informed of unsafe situations, the faster they can take remedial action. Along roadways across the country, governments are deploying intelligent transportation systems that use video surveillance to quickly assess a traffic situation, dispatch emergency personnel as necessary, and reroute traffic using networked roadside signs. For example, the state of Utah estimates that its Intelligent Transportation System (ITS), designed to maximize the efficiency of transportation in the state, saves Utah travelers $179 million and 9.8 million hours each year while preventing 948 traffic accidents and three traffic accident-related deaths.
- Maintaining services continuity during disruptions. When paralyzing winter storms hit Dallas Fort-Worth, Texas and call-center employees couldn't drive to work, a Cisco IP telephony solution automatically routed urgent citizen calls to locations that were out of the storm's path, providing continuity of service.

Public Safety Case Study: City of Everett, Washington

When the City of Everett Police Department in Washington added mug shots, outstanding warrants, critical incident checklists, and other law enforcement tools to its network, police officers readily adopted them to create a safer environment for the city's 100,000 residents. However, because the tools were only available from computers at the police station, officers were spending around four hours per 12-hour shift at the station—away from their beats. "It's great to have access to records and be able to network to other parts of the country to look for outstanding warrants or similar unsolved crimes," says Boyd Bryant, police sergeant and public information officer for the city of Everett Police Department and supervisor of the department's technology projects. "The difficulty is that during that process, officers are out of touch with the community. Their eyes are no longer engaged in what's happening on the street."

To increase the time that officers spent on patrol, the city of Everett set about making its network-based police tools available to officers in their vehicles. The solution was a Cisco wireless network. To create a wireless infrastructure, the city of Everett deployed several Cisco Aironet® wireless access points throughout the city so officers could access network-based tools while on patrol. Unlike the city's previous mobile networking infrastructure, the Cisco solution provides sufficient bandwidth to transmit high-quality photos, as well as text. Officers can access the network from squad cars that are equipped with laptops, rugged Cisco wireless and mobile routers, and optional field printers, cameras, and presentation tools. "With the ability to access driver's license photos, booking photos, outstanding warrants, and the future potential of remote fingerprint scanning services, officers will be much better equipped to identify and apprehend criminals," says Sgt. Bryant. And by avoiding the need for trips to the station to access network-based tools, the Cisco wireless network solution serves as a force multiplier. With mobile network access and voice recognition, the department expects to cut report writing time in half, adding to the amount of time officers can be on patrol. "We'll be able to put our officers back in contact with the public, giving us additional eyes and ears in the community," says Sgt. Bryant.

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—Boyd Bryant, police sergeant, City of Everett Police Department

The city of Everett plans to capitalize on its Cisco wireless network solution to improve public safety in other ways, as well. For example, police procedures can change frequently as a result of court decisions and policy changes in other areas of government, and the ability to instantly communicate changes will enable officers to make better decisions and reduce the department's liability exposure. And in disaster scenarios, emergency personnel can use the department's mobile command vehicles to transmit observations back to a command center, or even control mobile video cameras in areas unsafe for people to enter.

IMPROVING SERVICE EFFECTIVENESS

What Constitutes Service Effectiveness?

Service effectiveness can be measured by the following:

- **Citizen satisfaction and service speed.** The city of Greensboro, for example, improved the effectiveness of its building approval service by giving inspectors wireless access to information from hotspots throughout the city rather than requiring them to drive back to their offices, freeing their time to expedite inspections.
- **Innovation.** Innovation means delivering new services to address emerging citizen demands, or delivering existing services more effectively. The city of Everett will use wireless technology to deliver a new service, sending law enforcement tools to police officers' vehicles, while the city of Greensboro will use wireless technology to deliver its existing building inspection service more effectively.
- **Cost containment.** In a time of reduced budgets, state and local governments strive to improve service effectiveness without increasing costs. With a converged network that supports voice, video, and data, the Bernalillo County Metro Court in Albuquerque, New Mexico saves $14,000 per month in telephony costs and conducts video arraignments, bonding, and pretrial interviews to avoid the costs of transporting inmates to the courthouse.

Table 1 lists some of the ways state and local governments are already improving their service effectiveness with Cisco solutions.

Table 1. Cisco Solutions for Service Effectiveness

Proven Strategy for Increased Effectiveness	Example
Enable mobile employees to bring city services applications to citizens	In the city of Greensboro, North Carolina, building inspectors can access forms and information from their laptops instead of driving back to the home office, accelerating the inspection process.
Send emergency messages to passengers at airports, railway stations, and on freeways, either on displays or PDAs and pagers	New Jersey Transit personnel can deliver emergency information to officers carrying PDAs and to commuters, using an IP-based passenger information system at the Secaucus Transfer Station.
Allow emergency responders and school security guards to access criminal databases, floor plans, and real-time video footage of emergencies on the way to a crime or accident scene	The city of Everett police force can access mug shots, critical incident checklists, and the department's record management system from laptops in squad cars, improving their ability to identify and apprehend suspects.
Install roadside video cameras and enable government workers to securely access video feeds and other critical information from mobile devices	The city of Westminster in the United Kingdom enables its parking meter readers to capture a video of illegally parked vehicles, with a time stamp. Citizens who receive parking citations can view the video on the Internet, which has greatly reduced contested tickets.
Rapidly deploy temporary network and telephony services	The town of Herndon, Virginia set up a temporary media center with a bay of Cisco IP phones in just 20 minutes (see case study).

Service Effectiveness Case Study #1: Town of Herndon, Virginia

Located 20 miles northwest of Washington, DC, the town of Herndon, Virginia took up IP telephony to reduce its phone bills—and immediately experienced a 30-percent savings each month. But the town regards the more remarkable gain as improved service effectiveness, a result of sending important information instantly to employees' IP phones. For instance, the town has begun pushing Amber alerts, about missing or abducted children within a 50-mile radius, to the phones of road crews and other on-the-street personnel. A distinctive ring tone sounds, and then employees have the option to press keys on their phones to see more information on the phone displays, including suspect and victim pictures. "We suddenly have six times the number of eyes looking for abductees than we have police officers alone," says Bill Ashton, Herndon's director of IT. The town intends to extract more value from its system by relaying Emergency Broadcast System alerts about weather developments or terrorist threats to employees via both telephone and computer.

"We suddenly have six times the number of eyes looking for abductees than we have police officers alone."
—Bill Ashton, director of IT, town of Herndon

The IP telephony system also makes it easier for the town of Herndon to grant requests for new communications services. In early 2004, the town was engaged in an ongoing debate about extending rail service to Dulles International Airport. The train would roll just outside the town limits, so at one time the town became a focal point for the media, and Ashton needed a media center for the major news services—and in a hurry. "Six months earlier I would have declined," he says. "But with the 'mobility' feature in the [Cisco IP telephony solution], I just grabbed a few phones from stock, plugged them into a conference room, and added the newscasters and their phone numbers to the system. Within 20 minutes we had our media center."

Service Effectiveness Case Study #2: Bernalillo County, New Mexico

The new Bernalillo County Metropolitan Court in Albuquerque is New Mexico's busiest court, handling criminal, civil, and traffic complaints. In the past, the county had to transport inmates from the Metropolitan Detention Center, located 17 miles away, a time-consuming process that required hiring extra security guards at taxpayer expense.

Installing a Cisco IP Communications solution enabled Bernalillo County to change its processes by conducting video arraignments, bonding, and pretrial interviews via video. Now, intake officers at the court gather demographic, charge, criminal history, and other relevant information to determine if a person is eligible for release on his or her own recognizance. The ability to conduct remote interviews and arraignments accelerates the justice process, frees up staff for other tasks, and reduces the need for inmate transport vehicles and extra security.

From the same investment, Bernalillo County has improved its court recording services while cutting costs. In the past, court reporters sat in each courtroom, taking notes to help ensure that audio taped proceedings were accurately and comprehensively captured. Now, courtrooms are wired, and audio is captured and stored in digital format. Clerks can monitor four courtrooms simultaneously, which helps enable the court to reassign staff for more efficiency. As other state agencies adopt IP Communications, the ultimate winners are New Mexico taxpayers.

FOSTERING EDUCATIONAL EXCELLENCE

Enhancing Classroom Curricula

Excellent K–12 schools, community colleges, and universities attract residents and businesses to a community and help develop a skilled local workforce. One way that schools achieve excellence is by enhancing classroom curricula with network technologies such as live, interactive video and video on demand, both delivered over the network directly to the classroom. Live video enables schools to "bring the world into the classroom" with interactive presentations from the field. The ecology of salt marshes is more engaging for students when presented via live, interactive video from a scientist on location. Live video also makes it possible to offer courses to students in schools that otherwise might not have sufficient enrollment to make a course economically viable. If an advanced mathematics or language course is offered at even one school in the district, any number of students in other schools can participate fully via live video and interaction. Richer course offerings further increase the appeal of the

community to families with children. Video on demand provides supplemental instruction to students with special needs who need more time to master a concept, as well as to students who could benefit from enrichment.

The network also creates opportunities for collaboration with students in other classrooms, other schools, or even other countries. For example, students in a school in Milford, Massachusetts use videoconferencing to collaborate with their peers in a school in the Blackpool Local Education Authority in the United Kingdom to compare the effects of the industrial revolution on their respective towns. These two local governments not only are enriching education, they're also preparing their youngest citizens for the collaborative environment they'll encounter when they enter the workforce.

The network also helps strengthen the community at the university level. Leading-edge technology helps schools retain technology-savvy researchers and teachers, as well as attracting more students to apply and study—and the student population feeds town and city economies. California State University, Monterey Bay, contributed more than $100 million to local city economies in 2003 alone. Colleges and universities further the goal of educational excellence by providing students and faculty with wired and wireless Internet connectivity and advanced voice and data services anywhere on campus. Wireless access also improves research environments by enabling researchers to access databases from the field.

After graduation, college students tend to remain in the same community, a significant factor in the economic development of Silicon Valley, which has access to graduates of University of California at Berkeley, Stanford, and San Jose State University, and of Boston's Silicon Corridor, which has built much of its industry on the talents of Boston-area college and university graduates.

To align high school and college course offerings with local industry needs, community colleges and universities can offer professional development activities on the design and implementation of online curriculum systems. At the request of local businesses, teachers and professors who receive this training can develop online classes teaching skills that are in demand.

Improving Efficiency of Teachers and Staff

Educational excellence arises not only from an enhanced curriculum, but also from classroom time. Reducing the time that teachers need to spend with administrative chores such as taking attendance and looking up student records creates time they can devote to teaching.

With IP phones, which combine voice with built-in displays that teachers and staff can use to send and receive information, schools can save time and improve communications with parents, teachers, and school management. Simple applications on IP phones let faculty and staff take attendance, look up student information, locate students, summon emergency help, order supplies, look up medical information, locate teachers and students, broadcast emergency messages, send automatic e-mail messages to parents if a student is absent, and more.

Districts that enhance and streamline communications also significantly reduce costs, liberating funds that can be applied toward increasing educational excellence and thereby driving economic development. Sources of cost savings include replacing separate networks for voice, video, and data with a single converged network, and reducing long-distance charges and voice conferencing fees.

Educational Excellence Case Study: Charles County Public Schools

Located near Washington D.C. in the United States, the Charles County Public School system recently experienced an enormous population upswing, and needed innovative ways to provide educational excellence for the 25,000 students in the district's 31 schools. One strategy included using digital video for classroom-to-classroom collaboration, an enriched curriculum, enhanced teacher training, and access to subject matter experts in remote locations. "We want interactive video because we have courses we want to offer, but we don't have enough student enrollment to offer them," says Dr. John Cox, assistant superintendent for instruction. "This will allow us to have a course at one site going to another site on an interactive basis." The district has increased efficiency of teachers and staff by installing IP phones in every classroom, making it easier for teachers to communicate with office staff and parents, as well as to summon emergency help. For instance, a simple application on the IP phone lets Charles County teachers take attendance, look up pupil information, locate pupils, and order supplies. The IP telephony system improves staff productivity by allowing staff to report time in and out, look up medical information, locate teachers and pupils, broadcast emergency messages, and send automatic e-mail

messages to parents if a student is absent. “Our teachers are excited about IP telephony because it creates a sophisticated telephone that gives them the capabilities to do managerial duties in an expedited way,” says Cox.

DRIVING ECONOMIC DEVELOPMENT

Ways to Drive Economic Development

Economic development is an offshoot of service effectiveness. When a community delivers outstanding services, it can attract more people to live, work, and spend. Ways that governments drive economic development using their networks include:

- Improving access to education. Examples include offering online courses and job training, and extending access to the Internet to rural areas.
- Providing equal access to information for all constituents. State and local governments can offer convenient online or phone access to forms, council agendas, and other information.
- Making it easier to conduct business. A government that provides access to advanced communications services improves its ability to retain existing businesses and attract new ones.
- Improving the community’s quality of life. Communities improve their quality of life by improving street safety through wireless monitoring; providing citizens and businesses with convenient, online access to government regulations and other information; and providing computer literacy training and other educational and job training opportunities.

Economic Development Case Study: Greensboro, North Carolina

The third-largest city in North Carolina, Greensboro wanted to increase its appeal for commercial and residential construction. One candidate for process improvement was the inspection process. The Greensboro Inspections Department inspects existing and new construction for plumbing, electrical, mechanical, and structural compliance and safety. In the past, inspectors would travel from home to the main downtown office twice a day to return phone calls, receive their daily assignments, and file reports.

Greensboro resolved to improve its inspectors’ productivity and expedite the approval process by providing inspectors with wireless access to daily schedules, reporting, and e-mail. On average, this would eliminate nearly two hours a day per inspector of time spent traveling to the downtown office. The time could be spent instead on the work needed to approve the permits.

Greensboro achieved its goal by changing the approval process to take advantage of a wireless network that includes dozens of high-speed wireless access points across the city—in fire stations, police stations, libraries, parks and recreation centers, the water plant, the coliseum, the sewage treatment plant, golf courses, parking structures, and office buildings. Antennas on top of the structures provide a powerful signal that allows inspectors to log onto the network with their handheld and laptop computers, from within 300 feet of a building. Integrated network security protects the system from hackers and intruders.

Now, rather than spending valuable time driving to the main office, inspectors start their day in their vans, which are parked at any wireless access location. They securely log onto the city network, download the day’s itinerary, check e-mail, and begin work. At any time during the day, an inspector can upload reports, check e-mail, and receive updates at any wireless access point, freeing time to do their jobs instead of drive. As a result of this process change, building approvals for the city of Greensboro are faster. “We have calculated that [the wireless network] adds two hours per day per inspector, and we have 32 inspectors,” says Walter Simmons, code manager for the city of Greensboro. “That’s like getting eight new people without paying for them.” Faster approval is encouraging residential and commercial construction, an important contributor to economic development.

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—Walter Simmons, code manager for the city of Greensboro

TWO-PART APPROACH: PROCESS CHANGE ENABLED BY TECHNOLOGY

The state and local governments profiled in this white paper achieved their successes not from technology alone, but from process change enabled by technology. The Net Impact 2004 Study, conducted by Momentum Research, found that process re-engineering to take advantage of new technology significantly contributes to improvements in efficiency and cost reduction.

For instance, the city of Everett improved safety by giving police officers access to law enforcement databases from their vehicles, increasing the amount of time the officers are in the field, instead of at the station; the technology enabler was wireless. The Bernalillo Metro Court improved service effectiveness by conducting video arraignments with inmates in a remote location; the technology enabler was IP Communications. Similarly, the city of Greensboro stimulated residential and commercial building by no longer requiring building inspectors to use valuable time driving back and forth to and from the home office. Again, the enabling technology was wireless.

Cisco Systems offers state and local governments the solutions that enable process change. Solutions include Cisco IP Communications, Cisco integrated security, and Cisco wireless network solutions. The basis for all these solutions is the Cisco Foundation Infrastructure.

Cisco Foundation Infrastructure

The Cisco foundation infrastructure is made up of the Cisco routers, switches, optical solutions, and storage at the core of the network. With a Cisco foundation infrastructure, governments can expand their service reach to more locations and citizens; offer more services, more quickly; and facilitate interagency communications as recommended by the U.S. Department of Homeland Security.

Cisco IP Communications

Cisco IP Communications includes:

- IP telephony, which means sending voice over the same network used for data
- Unified communications, or receiving both e-mail and voicemail messages in one place—either the e-mail inbox or voicemail system
- IP audio, video, and Web conferencing
- Customer contact center

Cisco IP Communications solutions help to promote interagency collaboration, improve organizational efficiency, boost overall productivity, and enhance citizen satisfaction. The solutions help to deliver measurable return on investment and increase the attractiveness of the community for new residents and businesses.

Cisco Integrated Security

In the past, threats to state and local governments from both internal and external sources moved slowly and were easy to defend against. In today's environment, where Internet worms spread across the world in a matter of minutes, security systems—and the network itself—must react instantaneously. Cisco integrated security solutions enable state and local governments to implement comprehensive, end-to-end security that can be managed as a cohesive entity. Holistic security reduces costs while improving government's ability to continue to deliver vital services essential for citizen safety and employee effectiveness. Elements of Cisco integrated security include:

- Threat defense system to protect the network from threats, intrusions, and disruption of service.
- Secure connectivity system to protect sensitive data and files against unauthorized access and to enable governments to comply with federal regulations that control data privacy.
- Trust and identity management system to enable government organizations to extend secure network access to citizens, contractors, and mobile or home-based employees.

Cisco Wireless Network Solutions

Cisco wireless network solutions provide the foundation of a connected community by enabling state and local governments to deploy a secure, scalable, broadband network that combines wired and wireless communications. With access to information from anywhere in the city or state, mobile employees—inspectors, emergency workers, and others—can save time and make more informed decisions. The results are improved public safety and increased service effectiveness, essential ingredients for economic development.

THE CISCO APPROACH TO CONNECTING COMMUNITIES

Cisco develops its solutions for connected communities to help governments connect their citizens to important resources, with the goals of improving citizen safety, services, education, and economic development. The vision is for governments to improve their overall effectiveness in serving citizens while extracting maximum value from the budget. Uniquely, Cisco offers:

- Unmatched technical expertise
  - Almost 20-year track record as the industry leader in networking
  - World-class Cisco certified networking engineers with in-depth networking expertise
  - Extensive experience in scalable, network design; operations; management; and support
  - Extensive network deployment experience in the public sector around the world
  - A broad range of technical experts and engineers who understand government needs, standards, and important initiatives
- Unrivaled partnerships—Cisco maintains partnerships with industry IT leaders to help governments deploy a highly adaptable network infrastructure, as well as innovative applications that allow governments to extract the most value from their infrastructure investments to serve citizens.
- Highly interoperable solutions—Industry-leading, open, standards-based network solutions from Cisco deliver unmatched interoperability, which protects and extends customer investments.

CONCLUSION

Citizens cast their votes for officials whom they expect will provide a safe environment, deliver services effectively, improve education, and act in ways to make the community thrive economically. This can be challenging—lean budgets can prevent governments from devoting more resources to service delivery and safety. Today, governments across the country are meeting the challenge, by using their networks in new ways. Their rewards: economic development and improved quality of life for citizens.

For more information about Cisco solutions for connected communities, visit www.cisco.com/go/localgov.

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